

Utah Silicon Valley Alliance
Education Task Group Meeting
June 27, 2001

Members Present: David Pershing (Co-Chair), Suzanne Winters (Co-Chair), Bruce Bishop, Rob Brems, Dick Clayton, Pete Doenges, Martha Eining, Val Finlayson, Mike Finnerty, Sterling Francom, Ned Hill, Shari Kille, Rajiv Kulkarni, Bill Maasberg, Larry Madden, JoLynn Miller, Duke Mossman, Cindy Privett (for Amy Lewis), Darl Simmons, Jerry Stringfellow; **Staff Present:** Pat Armstrong, Annette Babisz

I. Introductions & Committee Membership

David Pershing welcomed the committee members and introduced Suzanne Winters as co-chair. Each attendee was also introduced. The members, representatives of public and higher education, business and government, were invited to serve on the Education Task Group because of their background and expertise. During the follow-up discussion, it was suggested that a representative from the Industrial Advisory Board also be invited to serve as a member.

Background information on the Utah Silicon Valley Alliance was presented (Attachment I) and the overall purpose of the Education Task Group was discussed. Last fall, a summit was held to identify the state's assets and liabilities in relation to accelerating Utah's emergence as a center for technology and entrepreneurship. Several committees were developed to target specific issues and then propose solutions. The findings and recommendations were presented to the Governor and based on that information he then created approximately 20 task groups and charged each one with specific goals and targeted outcomes. Additional information on the recommendations and task groups is available on the Utah Silicon Valley Alliance website: www.utah.org/silicon

II. Discussion of Key Goals

The co-chairs introduced the goals of the Education Task Group (Attachment II) and during the discussion, several inter-related topics were brought to attention by various members. Three sub-groups were organized and leaders were assigned to implement each goal. The members were invited to choose which of the three sub-groups on which they would like to participate. To participate on the sub-groups, please contact Pat Armstrong (pat.armstrong@utah.edu) or Annette Babisz (ababisz@dced.state.ut.us).

Goal 1:

Define specific actions required to accomplish the Governor's objective of doubling the number of science and engineering graduates in 5 years (and tripling in 8 years).

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Goal 2:

Work to establish entrepreneurship training in Utah's colleges and universities.

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Goal 3:

Identify programs to ensure that the state's K-12 programs are preparing sufficient, technically-trained students for the growing engineering / CS programs as well as the related technology programs to meet the state's workforce needs.

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III. Meeting Schedule

The next meeting of the full task group will be in approximately 2-3 months. In the meanwhile, each sub-group should meet on a regular basis to work on their goals. Members will be notified of all meetings by e-mail. Opportunities to host locations will be rotated among the various members.

Utah Silicon ley Alliance
Sub Committee of the Education Task Group
7/31/01

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DRAFT

K-12 Education Task Group

K-12 STRATEGY FOR TRIPLING THE NUMBER OF SCIENCE AND ENGINEERING GRADUATES FROM UTAH'S UNIVERSITIES

Or How to Interest More Kids and Better Prepare Them to Pursue Higher Education for Careers in Science, Math, Engineering and Technology (SMET)

Statement of Problem as It Relates to K-12 Education

- Inadequate numbers of Utah students entering institutions of higher education pursuing SMET
- Students pursuing SMET at higher education institutions are inadequately prepared
- Too few women and minorities enroll in and complete high-school math and science classes to succeed through the SMET higher education curriculum

Strategy

We are interested in a dramatic reform of K-12 SMET education, designed to change the way science and math are taught in most Utah schools. We also want to breach the wall of resistance to change that seems to surround our educational system. This strategy is broken into three areas, the Task Group believes need to be addressed: Teachers, Students and Programs

Teachers

Inadequate salaries for high-school science and math teachers
Many high-school science and math teachers are ill-prepared (many are not endorsed by state)
Many elementary and middle school teachers are science/math phobic
Large class sizes, particularly in elementary grades make hands-on experiential learning difficult

Recommendations:

Teachers of high demand career subjects should be compensated according to demand (supply/demand economics)
Offer incentives for "outstanding" student results on standardized tests and non-standard (out of the box) performance measures
Require that all teachers of SMET receive and are compensated for State endorsements
Require pre-service teacher education has integrated curriculum with SET, particularly for elementary teachers including hands-on and experiential learning
Reduce class size in elementary IF teachers are willing to adopt hands-on and experiential teaching.
Require adherence to the State Core Curriculum

Students

Too few students electing 3-4 years of high school science and math classes
Elementary students learn by the age of 9 that science and math are to be avoided at all costs
Too many girls and minorities opt out of SMET classes due to initial poor performance
Too many girls and minorities are actively discouraged by teachers/counselors/parents from pursuing high school SMET classes.

Recommendations

- Require a minimum of 3 years (4 would be better) of high school (grades 9-12) science for graduation.
- Rewrite State Core Curriculum to teach "Physics First"
- Mandatory mentoring/counseling of high school SMET students/classes with representatives from academia and industry.
- Significant incentives and public recognition for participation in science fairs and competitions

Programs

Recommendations

- Integrate the entire K-12 curriculum such that students learn how subjects interrelate (i.e. colors used in art class are physics electromagnetic radiation waves, English focus on technical writing skills etc.)
- Implement a new "University High School" using simulation technology (see accompanying paper)
- Develop statewide incentives/recognition for mentors from academia and industry to participate in the classroom
- Provide a "coordinating body" for informal SMET programs and provide funding for distribution of information
- Develop a multi-media campaign in partnership with industry to "market" the SMET careers and eliminate the "nerd" image.
- Provide remedial math and science preparation for students entering higher education

Status Report

Education Task Group

Overview

Initially the Task Group met to define its key overall goals and develop a plan of attack. Three specific goals were selected based on the activities of the prior Education Committee within the Alliance:

- 1.0 Define specific actions required to accomplish the Governor's objective of doubling the number of science and engineering graduates in 5 years (and triple in 8 years.) In particular, provide support for and coordinate with the Technology Initiative Advisory Board created by SB 61.
- 2.0 Characterize current entrepreneurship training opportunities in Utah's colleges and universities and define additional needs.
- 3.0 Identify programs to ensure that the state's K-12 programs are preparing sufficient, technically trained students for the growing engineering / CS programs as well as the related technology programs to meet the state's workforce needs.

Sub groups were then developed to address each of these specific goals. During the past few months, the major focus has been on the need for additional pump priming activities in the K-12 arena. The primary problem is how to interest more kids and better prepare them to pursue higher education in pursuit of careers in Science, Math, Engineering and Technology (SMET).

Statement of the Problem as It Relates to K-12 Education

- Inadequate numbers of Utah students entering institutions of higher education pursuing SMET
- Some students pursuing SMET at higher education institutions are inadequately prepared
- Too few women and minorities enroll in and complete high-school math and science classes to succeed through the SMET higher education curriculum

Strategy

The group is considering suggestions for K-12 SMET education, designed to enhance the way science and math are taught in most Utah schools. If we are indeed going to double the number of college graduates in these fields, we must substantially grow the number of high school students taking appropriate

preparatory coursework. The group has focused on incremental changes that could produce successes through rapid implementation as well as more dramatic alternatives.

The strategy of the Task Group was to focus on three areas, 1) Students and their curricula; 2) Teachers, their preparation, methods and ongoing training; and 3) Programs specifically designed toward attracting and better preparing students to pursue SMET careers. Draft recommendations have now been developed and the group members are currently reviewing them.